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A COMPARISON OF THE TRANS-APPALACHIAN RAILROADS

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If one were to draw a cross profile of the Appalachian system of ridges, and let a line ten inches long represent the distance between the Mississippi River and the Atlantic Ocean along the fortieth parallel, the Appalachians would be represented by a mere thickening of the line; for the highest ridge would need be represented by an elevation of but one-two hundredth of an inch. But small as they seem when compared with the broad expanse of plain to east and west, they have an important bearing on the location of trade routes, on determining the importance of such routes, on the distribution and growth of cities, and have had an important bearing on the whole trend of historic events from the time our forefathers began to leave the seaboard and extend their civilization westward. Such an important bearing did they have on this expansion in the seventeenth, eighteenth, and early nineteenth centuries that they have been termed by writers "The Appalachian Barrier."

This barrier consists mainly of two important ridges, the Blue Ridge on the east and the Alleghany Front, the eastern edge of the Alleghany plateau, on the west. Between these two ridges lies a region called by physiographers "The Great Appalachian Valley," which extends from Georgia northeastward to the Hudson, and there, taking a northerly trend, forms the depression between the Catskills and Adirondacks on the west and the Berkshires and Green Mountains on the east.

In Fig. 1 the Blue Ridge shows itself as a few slight ridges in northern New Jersey. In Pennsylvania it is almost lacking, but in Virginia and North Carolina it rises to elevations of over three thousand feet. The Alleghany Front in the north is encountered at the east edge of the Catskill Mountains. In east Pennsylvania it is of slight elevation, but in western Pennsylvania, Maryland and eastern West Virginia it rises to bold ridges and peaks, in some places over four thousand feet above sea level. It again sinks to insignificance in eastern Kentucky and Tennessee. The Great Appalachian Valley in the north is narrow and cut up by many short ridges more or less parallel to one another and to the Blue Ridge. In the south it broadens and opens out upon the Gulf Coastal Plain in Georgia and Alabama.

In the north this Great Valley is drained by rivers flowing eastward into the Atlantic—the Hudson, Delaware, Susquehanna and Potomac. Farther south the drainage is to the west, while at the south the rivers extend to the southwest. The Hudson flows lengthwise of the valley like

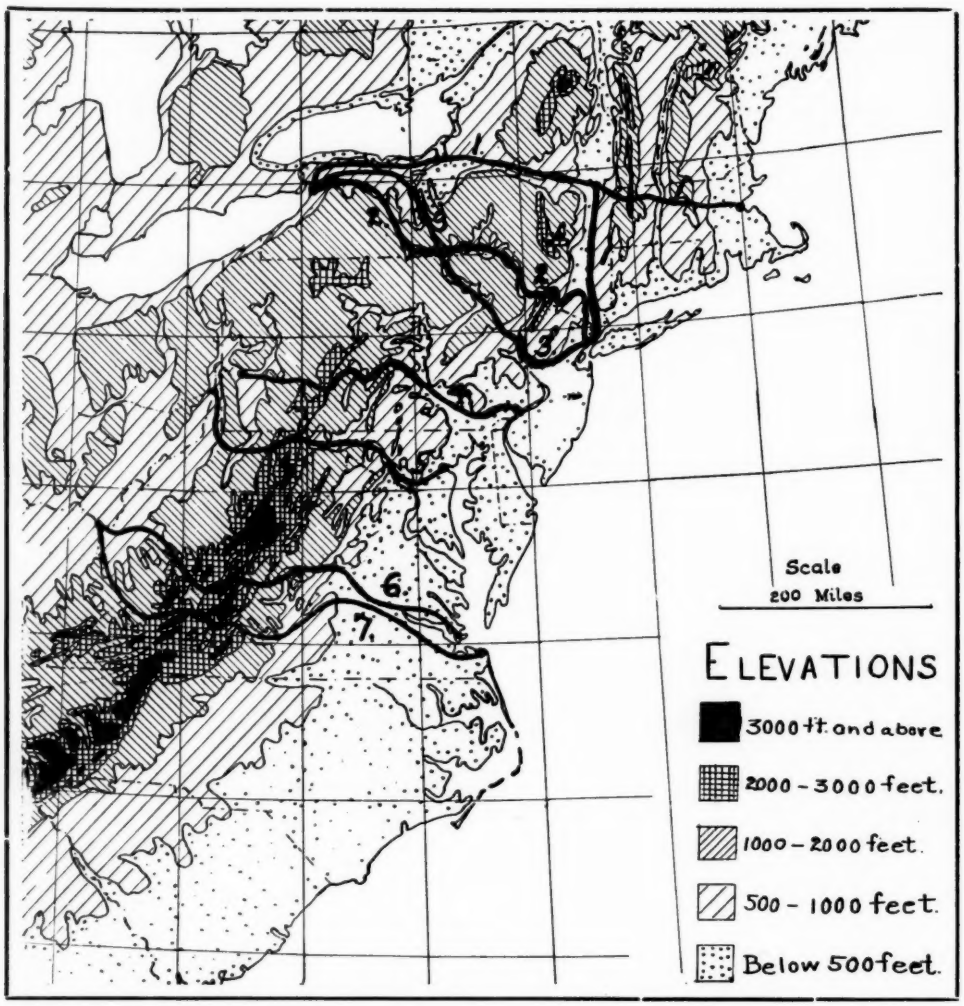

Fig. 1.—The Important Railroads of the Appalachians and the Relief. The several roads are represented by numbers.

1. The New York Central with the Boston and Maine from Albany to Boston. 2. The Erie. 3. The Lehigh Valley. 4. The Pennsylvania. 5. The Baltimore and Ohio. 6. The Chesapeake and Ohio. 7. The Norfolk and Western.

the rivers of the South; but the Delaware, Susquehanna and Potomac, which rise far over on the plateau to the west of the Alleghany Front, extend across the valley, cross through the ridges, and escape through gaps in the Blue Ridge.

The great difficulty encountered by the emigrant and railroad builder in crossing the Appalachian barrier was not in the Blue Ridge, for this could be crossed through the gaps. Nor was it in the ridges in the Great Valley; these too had gaps. The greatest obstacle was the surmounting of that bold front of the Alleghany Plateau. All the trans-Appalachian roads except the New York Central and the Erie have to overcome this two-thousand-foot obstacle. Every train passing westward across the region must lift its burden up these two thousand feet, and every train moving eastward from the Ohio River must rise from twelve hundred to fifteen hundred feet. But not so, however, with the roads along the Hudson-Mohawk route. The Hudson Valley, joined by the Mohawk from the west, forms the only natural outlet to the east from the Great Central Valley of North America and has well been called "The Eastern Gateway of the United States."

Figure 1 shows the routes taken by the several roads. Three lead from Buffalo to New York. Each of these roads has extended its line to the western termini of the Great Lakes by means of steamboat lines. The four roads to the south tap the great agricultural region of Kentucky, Ohio, Indiana, and Illinois, with a few lines extending to the Erie lake-ports. Figure 2 gives the profiles of these various roads and shows the great advantage of the New York Central over the other routes, when lift or grade is considered. Its highest altitude is reached at Batavia, about nine hundred feet, and another slight rise at Rome, up to four hundred forty-five feet. Almost parallel to this road and taking advantages of the same low grade is the West Shore, not shown in profiles or map. The Erie (No. 2), after leaving the Hudson river passes through a gap at Paterson, winds among the Highlands of New Jersey, and reaches at Middletown, N. Y. an elevation of five hundred sixty-two feet. Near Port Jervis it descends into the valley of the Delaware and continues in this to the northeast corner of Pennsylvania. East of Binghamton, N. Y., at Gulf Summit it crosses over the divide between the Delaware and upper Susquehanna, reaching a height of thirteen hundred sixty-four feet. It descends one branch of the Susquehanna and then ascends another coming in from the northwest, finally attaining its greatest elevation, 1400 feet, where it crosses the terminal moraine just west of the Genesee river; this is five hundred feet above the highest point reached by the New York Central.

The Lehigh Valley Railroad after crossing northern New Jersey to the Delaware ascends the Lehigh River to Bridgeport. Its greatest lift is found when it crosses over the divide between the Delaware and Susquehanna, at Glen Summit Springs, where it reaches an altitude of about 1750 feet. We have seen that the Erie road crosses the same divide

*Note.—The Erie, however, at two points reaches elevations of about fourteen hundred feet.

at a much lower level. This elevation on the Lehigh Valley road corresponds to the Alleghany Front found by the other roads further south. The Pennsylvania Railroad encounters the Alleghany Front near Cresson, crossing it at an elevation of about two thousand feet. The Balti-

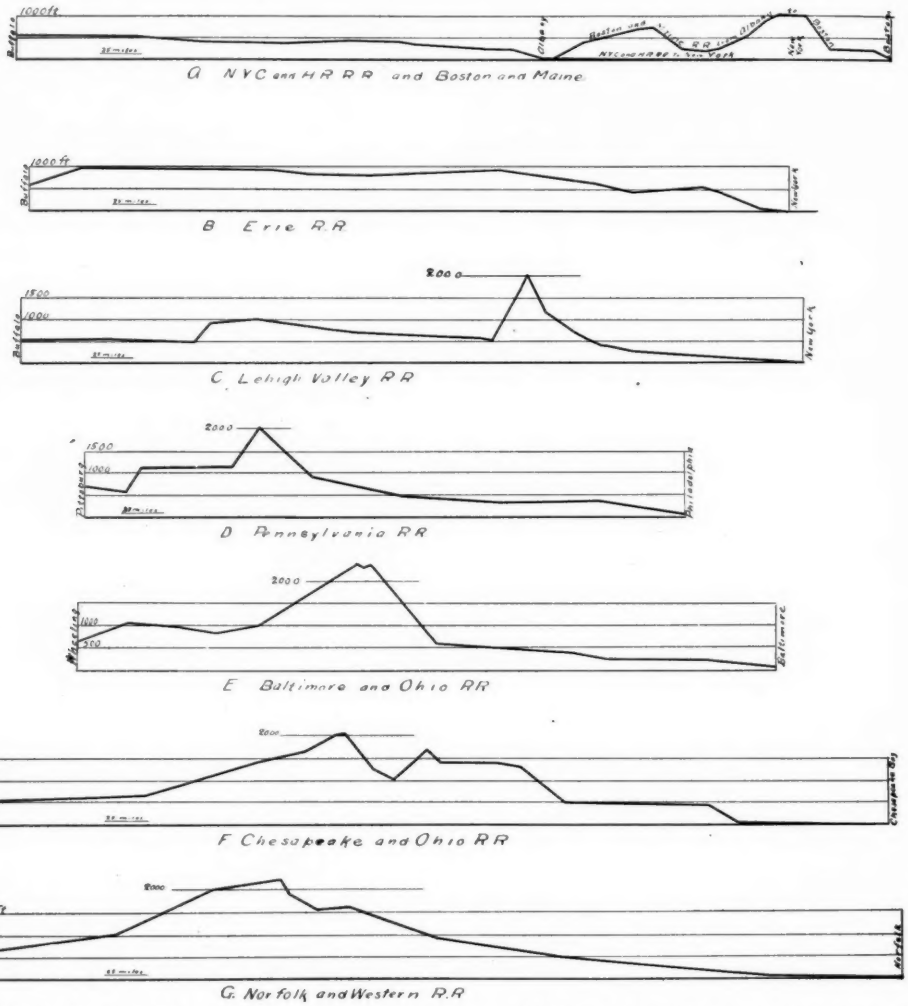

*Fig.—2. Profiles of Trans-Appalachian Railroads. The vertical scale is 125 times the horizontal.**

more and Ohio surmounts the plateau in western Maryland near Oakland at an elevation of two thousand three hundred and twenty feet; the Chesapeake and Ohio near Alleghany; and the Norfolk and Western at Blue-

*Note.—Based on altitudes in the Dictionary of Altitudes by Gannett. The altitude of each Station on each line was found and the elevations between stations were checked up by as many contour maps as were available. There may be slight defects, but in the main the profiles are true. See figures in the text for exact values.

fields in West Virginia. In all these routes the advantage of the northern route is clearly shown by a comparison of the profiles.

But the most striking thing that comes out in this comparison of the profiles of these Trans-Appalachian Railways is the almost continuous down grade of the roads between Buffalo and New York by way of the Mohawk and Hudson rivers. The only distinct rises on the whole route are just east of Buffalo and at Rome. From Albany to New York there is an imperceptible down grade. How different is the route to Boston as shown by the Boston and Maine profile! Had the merchants of Boston early been made to understand the significance of what is revealed in these two profiles, they would not have been liable to such a huge disappointment on the completion of this line. The story of this road is an interesting chapter in the history of transportation.

As settlers began to spread over the Great Central Valley and send their goods east to New York by way of the Mohawk pass, the merchants of Boston saw great commercial possibilities in this trade and desired to share in the traffic. In early days, during the canal period, a canal from Boston to Albany with a tunnel through the Berkshires was advocated. But definite action to secure what they considered their rightful share in the traffic was deferred until the railroad period, when it was again brought forward. This resulted in the building of the Boston and Albany Railroad in 1842, but this did not produce what was hoped for. A more direct route was thought to be needed and one of lower grades, and so in 1842 the Troy and Greenfield R. R. was incorporated. This later came to be the Boston and Maine R. R. and made a lower grade through the mountains in western Massachusetts by the construction of the then wonderful Hoosac tunnel. This five-mile tunnel was completed in 1873, after eighteen years of more or less continuous labor at a cost of $14,000,000.

A writer in Scribner's Magazine of 1870, three years before the completion of the tunnel, expressed the expectation of the New Englanders.

"It is a matter of wonder that those enterprising gentlemen who proposed during the late war to reconstruct the map of the United States, leaving New England out in the cold, did not discover and point out the fact that New England is divided from the rest of the country by a mountain wall which might well serve as a boundary of a separate state. * * * * The commercial intercourse of New England with the West has been greatly obstructed by this barrier. The western merchant arriving at Albany or Troy by railroad or canal finds a magnificent river waiting to bear him and his merchandise to New York; while between him and the New England market stretches for hundreds of miles up and down an abrupt and difficult mountain wall. It is not surprising, therefore, that he goes to New York with his merchandise. Emigration may follow parallels of latitude, but traffic always follows the easiest and shortest route with no reference at all to parallels or pedigree.

"The people of New England did not, however, sit down behind their mountain wall and suck their thumbs. Close business relations with the great West were essential to their prosperity and they determined to establish and maintain them. Some way must be provided whereby a share of the western trade might reach their markets. If the mountain would not give way to Mahomet, Mahomet must go through the mountain. That is how the Hoosac Tunnel came to be built. It is a clear announcement that New England does not intend to be left out in the cold."

But, alas, the announcement was of no avail. Traffic continued to follow "the easiest and shortest" route and New York continued to get the lion's share of the western trade, and grew. In 1790 New York's population numbered 33,000 to Boston's 18,000. By 1850 New York had grown to 515,000 while Boston's population numbered but 137,000; and by 1870 New York's numbers reached 942,000, while Boston numbered 250,000, mostly due to the location of New York at the entrance to the "Eastern Gateway of the United States."

This gateway has always had a great influence on man. West of it, on the plains of glacial Lake Iroquois, dwelt many strong and warlike Indians who used the pass in the Mohawk valley on their expeditions of hunting or of war. The Mohawk was a part of the old Iroquois trail that led from the mouth of the Mohawk to Niagara Falls. The Dutch fur-trader early found his along this same route. In pioneer days emigrants to the West found this their easiest road. It was early given the preference in the transportion of goods by wagon from the then West to the East. Along this route was built the first American canal of any note, and among the first railroads in America was one from Albany to Schenectady, a distance of eighteen miles. Along it has been concentrated many industries and cities, so that "80 per cent. of the people and 90 per cent. of the wealth of the state of New York is found in the counties bordering the Hudson River and the Erie Canal." Today six tracks lead through this route from the city of Buffalo, which draws its freight from a large territory bordering the Great Lakes. In 1906 over 4,000,000 tons of grain and flour passed into the port of Buffalo and over 491,000 thousand feet of lumber was unloaded there and at Tonawanda, its neighbor. Most of this grain, flour, and lumber finds its way over the Appalachian barrier by way of the Mohawk-Hudson route. The lines to the south get little of the lake traffic. Cleveland in 1906 received but 37,000 tons of grain, while the receipts at Toledo were but 8,000 tons. In lumber Cleveland received 174,000 feet and Toledo 38,000. It is true that in the rich industrial and agricultural region to the south of the Great Lakes, the Pennsylvania and other trans-Appalachian roads have their "feeders." But so have the roads that lead through the Mohawk-Hudson pass, and hence Nature and man have designed these roads to be the most important of the trans-Appalachian routes.

GEOGRAPHICAL INFLUENCES IN THE DEVELOPMENT OF NEW YORK STATE

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Prefatory Note:—

The writer lived until a few years ago in New York. In connection with the preparation of a small volume on the geography of that state, he had occasion to examine somewhat carefully the various geographical influences which have helped to mould its growth. Though no longer residing there, he trusts that the thirty years spent in New York will give him the privilege of representing his native state in this series of articles.

When the colonies were being blocked off into states, a good many boundary compromises had to be made. It was a give-and-take process. In the final adjustment, New York held a strategic point of great importance, the mouth of the Hudson river—the harbor around which has grown up the ~~second~~ Empire city of the world. New York affords a striking illustration of the influence which purely geographic features may exert in the industrial growth of a state. Two previous articles in this magazine have pointed out the advantage which may accrue to a state* on account of favorable geographical position. It is the chief purpose of this paper to show how four physiographic features, joined in a chain, lie at the foundation of the commercial and industrial leadership achieved by New York state.

Aside from part of Long Island, New York's entire coast line is comprised within the limits of one city. Nearly all of the original colonies have more shore line. New York pushes a wedge of land between New England and New Jersey, barely gets the thin edge down to the sea, but that narrow edge has proved to be worth more than any strip of coast on the seaboard of either America. A few facts may serve to impress this point.

Add together all of the exports from all of our ports on the Pacific, the Gulf and the Atlantic (without New York), and they about equal those of New York alone. Add together all of the imports that come to all of our coast cities, except New York, and they do not equal the imports through this one city. Count all of the people who live in ten states in the western third of this country and they are less than those who live in New York city. Add together the value of all of the manufactures of all of the southern states—11 of them—and the total, splendid as it is, falls below the total of this single city. Add together the clearings of all of the reporting banks in the United States outside of New York, and they total but 60 per cent. of the clearings of this city (in 1909).

At once the question arises, Why?

*New Jersey, Jan. '08, vol. VI, p. 177; Indiana, Sept. '10, Vol. IX, p. 1.

A full answer would be difficult. The causes that have brought it about are, of course, intricate. Prof. F. V. Emerson has thrown light upon the geographical influences which have been potent in accomplishing the remarkable result.* How much weight we may properly give to purely geographic causes is impossible to determine. That the underlying cause is to be found in a connected group of singularly favorable natural features is unquestionable. However, before discussing this dominant influence, I wish to mention briefly certain other geographical influences. Two factors have promoted manufacturing in the state:

1. Nearness to the coal mines of Pennsylvania, and hence cheap fuel;

2. Abundant water power. Around the falls of the Genesee grew up Rochester, once the greatest flour-milling center in America. Along the Mohawk is a string of manufacturing cities and towns, forming the center of the knit-goods industry in this country. One of these cities, Cohoes, for years made half of the hosiery annually manufactured in the United States. Along the Black river and the Upper Hudson are chains of paper and pulp mills, built to utilize the water power, and the spruce forests of the Adirondack region. This region is still the largest producer of wood pulp and paper. At Niagara Falls are the greatest power plants in the world. In the amount of water power developed, New York leads all of the states.

In dairy products it still leads, notwithstanding the rapid growth of dairying in Wisconsin. The latter state is now said to make more butter and cheese, but it does not closely approach New York in the production of milk. Three geographical causes underlie this industry:

1. The demand for these products, especially for milk, in the many cities in New York;

2. The preponderence of clay soil in large areas of the state. Such soil, because of its moisture-holding quality, supports the best meadows and pastures;

3. The hilly—almost mountainous—character of much of the state. These hill farms have much land that is too steep to till, but can be profitably pastured. Dairying is of small importance on the Ontario plain.

New York produces more apples than any other state and more grapes than any except California. The prize apple orchards are in the counties bordering on Lake Ontario. A yield of a million bushels a year is nothing unusual in one of these counties. Chautauqua County on the southern shore of Lake Erie is the grape belt; here are miles of vineyards. In case of both the apples and the grapes, a simple climatic influence explains the reason. It is the influence of the lakes in protecting the fruit from both spring and autumn frosts.

*Bull. Am. Geog. Soc. 40:587, 726 and 41:3.

The southern part of New York belongs to the Alleghany plateau. In it the upper branches of the Susquehanna have incised deep valleys. Many of them are more than a thousand feet deep. The only possible railway routes through the southern counties are through these valleys. By determining where the main railways should run, these valleys determined where industrial centers should be. The only two cities of any size are at junctions of these valleys. Three important railway lines connecting New York and Buffalo traverse these main valleys, the Erie, the Lehigh Valley and the Delaware, Lackawanna and Western.

There is one negative geographical influence in New York that is sufficiently interesting to be mentioned. While Lakes Superior, Michigan and Erie have large and important commercial cities, Lake Ontario has not a single one on the United States side. The barrier formed by Niagara Falls has entirely cut off Lake Ontario from any considerable participation in the enormous traffic on the Great Lakes.

While each of the foregoing influences has been a factor of importance in affecting the economic growth of the state, the chief influence remains to be discussed.

Without New York City, the state would hold only a medium rank in population, wealth, commerce and manufacturing. For a hundred years Boston was a more important port than New York. In 1820 Philadelphia had about the same population as New York, and did an equally great amount of business. New York was by no means the leading colony prior to the Revolution, or the leading state in the early days of the Republic. It was not until the United States began to grow into a commercial and industrial nation; not until the great interior, west of the Appalachians, became an actual part of the nation that the exceptional geographical features of New York state were realized. When people began to settle beyond the Appalachians in large numbers a new condition arose. The upper Mississippi Valley could turn its great resources into actual wealth only by connection with the eastern states and Europe, where lay a market for its products. So long as it cost more to deliver western wheat or corn or meat to the eastern coast than those products would sell for when they reached the East, there was little use of raising a surplus of crops in the West, no matter how cheap the land or how productive.

In the first decade of the 19th century, it cost $100 a ton to get freight from Buffalo to Albany. The development of the Middle West was absolutely dependent upon an outlet either to the east or to the south. For many reasons the latter was impracticable. To facilitate the trade between the East and the West, the famous Pittsburg turn-pike was built from Philadelphia to Pittsburg. Products of western New York went down the Susquehanna and were shipped to Europe from Baltimore, or down the St. Lawrence by way of Montreal. The lead ore of Wisconsin reached

New York by way of New Orleans. During all of this time, New York state seemed to be at a disadvantage. Then came the Canal Era, and New York's peculiar topography became the one determining factor in the future growth of the state.

When it began to appear that a waterway from the eastern seaboard to the West would so lessen freight charges to and from the West that the eastern terminal city of that waterway would command the vast trade with the interior, Baltimore, Philadelphia and New York eagerly turned their attention to canals. The day of canal traffic has probably passed; but there is not the slightest question that the geographical conditions which made possible a canal from the Great Lakes to the Atlantic were the beginning of the phenomenal growth of New York and gave the state a momentum which has continued. A canal from Baltimore to the Ohio was attempted, built up the Potomac to Cumberland, but there it stopped. It stopped because there was no gap by which a waterway could be carried across the mountains. Pennsylvania attempted a canal from the Delaware to the Ohio. It reached the foot of the Alleghany escarpment, but a canal cannot ascend a mountain wall, and no gap led to the Ohio; the Portage Railroad was built to carry goods over the divide, but this was only partially successful. To connect Philadelphia and Lake Erie by a waterway was impossible. South of New York, no water gap, no low pass, leads across the eastern ranges. Consider, now, the conditions in New York.

1. The mouth of the Hudson is a drowned valley. The drowning has not only deepened the bay beyond the requirements of the largest ships, but it has produced several islands—Long, Staten, Manhattan and others —which enclose the bay and greatly extend its water frontage. This made possible the building of the great number of piers without which New York's present shipping could not be handled.

2. The sinking of the land changed a small Hudson into a deep one with practically no current. From Albany to New York, 150 miles, the river falls only five feet. It is really an arm of the sea.

3. Westward from the Hudson extends the Mohawk Valley—"The Eastern Gateway of the United States." Here the Appalachian mountain system is narrow and comparatively low. During the close of the Glacial Period, while the glacial ice still blocked the St. Lawrence, the Great Lakes drained to the sea by way of the Mohawk-Hudson valley, cut a notch through the eastern mountain range and made a continuous valley. Thereafter the Mohawk headed west of the mountains and a low gap—the only one from Canada to Alabama—had been opened across the Appalachian highland.

4. From the Mohawk westward is a plain 20 to 30 miles wide, leveled by the scraping and filling of the ancient glacier. So level is this plain that one reach of the Erie canal is 50 miles long without a lock. The

only difficulty was encountered in rising from the Ontario plain to the higher level of Lake Erie, necessitating a series of locks at Lockport.

For fifty years the Erie Canal, twice enlarged, carried an enormous traffic. Freight rates dropped as low as a dollar a ton from Buffalo to Albany. The surplus products of the Middle West poured through it and New York city soon outstripped all competitors. Had the physiography of Pennsylvania or of Maryland, instead of that of New York, been favorable for the canal, Philadelphia or Baltimore must, it seems probable, have been more important cities than New York.

Not alone did the canal (and the trunk line railroad which later followed the same route) build up the city of New York, but the same influences built up other parts of the state, for other canals connected Lake Champlain, Lake Ontario, the Finger Lakes, the Black River and the Genesee Valley with the Erie Canal. No other state had such a system of inland waterways, because no other eastern state had such a favorable physiography. The overshadowing importance of this trade route from the Atlantic to the lakes may be seen from such facts as these:

1. New York is a state of large cities and every one of them is along the canal route (including, of course, the Hudson). The largest city not on this route, Binghamton, has somewhat more than 50,000 people. The population of the cities in the canal counties is more than twenty times as great as the city population outside those counties.

2. The population of the 30 canal counties is about nine times as great as that of the 30 non-canal counties.

3. The assessed valuation of these 30 canal counties is about ten times that of the other 30 counties.

4. The excess of the value of manufactures in the canal counties over the remaining part of the state is equally great.

It is not to be understood that the Erie canal is the cause of all this. The canal was a big factor. The New York Central Railroad, which parallels the canal with four tracks, has been and is a large factor. The noteworthy point is that a combination of harbor, drowned river, low gap through the mountains, and level lake plain—all physiographic features—have exerted a preponderant influence in the making of the Empire State. It was the canal that, for several decades, brought to New York City the major part of western shipments, and which gave that city unequaled advantage in supplying western trade. It was the big export shipments brought to New York by the canal that made that city the one American port where trans-Atlantic ships were most sure of finding a cargo, and gradually made that harbor the point on which railway lines from all states, and steamship lines from all seas converged and exchanged traffic.

Conclusion

A variety of factors, both geographic and non-geographic have combined to direct the economic development of New York. Without any considerable mineral wealth of its own, it fortunately lies next to the greatest mineral-producing state of the Union. The ungraded courses of many of its rivers, chiefly due to the work of the glacier, have supplied water powers of great value. The hilly topography and clay soil have favored dairy farming in a large part of the state and made it the first state in dairy products. The climatic influence exerted by Lake Erie and Lake Ontario has resulted in extensive fruit raising, making New York first in the production of apples and second only to California in the production of grapes.

But the one dominant influence which has promoted the development of the state in manufacturing, in commerce, in wealth and in population lies in a chain of four unique physiographic features. These features are (1) the deep, enclosed, spacious harbor produced by drowning the mouth of the Hudson river; (2) the deep, navigable river itself leading 150 miles inland; (3) the low gap through the eastern mountains, cut by the Mohawk, and (4) the glacially-leveled plain which joins the Mohawk valley to the Great Lakes. Out of these four conditions grew the waterway that gave the chief impetus to the growth of the state, and particularly to the growth of its largest city.

Announcement

The February number of the Journal will be a Commercial and Industrial Geography number. The articles and discussions will be devoted largely to this increasingly-important phase of the subject. The March number will be under the editorial direction of Professor W. M. Gregory of the Cleveland Normal School. Professor Gregory has been on the editorial staff of the Journal for many years and we believe our readers will welcome this special Ohio number. The contributors will be, for the most part, Ohio teachers and professors.

THE WORLD'S GREAT RIVERS

The Volga

By Frederick Homburg

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The Russian divide lies well within its glaciated territory, i. e. far toward the north and west; hence the largest rivers flow toward the south and southeast. The whole country may be rated as a low plain with its greatest elevation in the region of the Valdai Hills. Hence this rise of ground forms a sort of hydrographic center, where, within a circle of comparatively small radius, are found the headwaters of the most important streams.

The rivers in this region not having as yet cut deeply into the plain are separated by level stretches, formerly used as convenient portages, and in modern times cut by canals. Remembering that land travel in Russia has always been difficult, for the roads are necessarily poor and the railroads not well developed, the importance of the rivers as means of communication is at once apparent. By means of the canals just mentioned, water connection is established between the Baltic, Black, Caspian and White Seas. Through the ages and to this day, the rivers of Russia have been its channels of commerce, and this in spite of the serious drawbacks of being ice-locked in winter, dangerous at the time of the great spring floods, and treacherous during the summer drought because of sand bars at low stage. Like the Ohio, these rivers vary enormously in volume with the seasons.

The most important of all these waterways is the greatest river of Russia and Europe—the Volga. Like other Russian rivers it has a gentle fall; there are no rapids, and it is navigable far toward its head, where, by means of the canal system, it is joined to other large waterways of the empire. The Volga has not inaptly been compared to our Mississippi, in that it drains the greatest plain of its continent, and in having two great tributaries; the western, the Oka, corresponding in many respects to the Ohio; the eastern, the Kama, corresponding to the Missouri. The Oka reaches the west, the Kama reaches east to the Urals; the main stream, the Volga, the southeast and the Caspian. At the great bend at Zarizyn the Volga comes within 35 miles of the Don, and in the northwest, it is joined by canals to the Neva and the Dwina systems. It takes but a glance at the map to show why the Great Fair at Nijni-Novgorod, at the confluence of the Oka and the Volga, is still such a factor in the commerce of the empire. One would scarcely expect

such a low-country stream to do much river work, yet in consequence of the volume of its waters, especially at the time of its mighty floods, it has great erosive and carrying power. It erodes in a manner somewhat peculiar to the rivers of South Russia; it sticks to its right bank, and is constantly working toward the right. As a consequence, from Nijni-Novgorod down to Zarizyn, the right bank is steep, even precipitous, in certain reaches nearly 1,000 feet above low water mark, while the left bank is a wide, flat flood-plain, rising in broad terraces to the height of the opposite bluffs. German geographers account for this "westing" of the waters by a modification of the current due to the earth's rotation; but this by itself would hardly serve as an explanation, inasmuch as the bluff shore is to the right in all its directions, east or south, until at Zarizyn, it suddenly turns from the bluffs to wind the rest of its way between flat banks on both sides. Traveling on the Volga is bound to be tiresome because of this sameness of scene.

After the Volga turns from its steep bank at Zarizyn to flow out into the Caspian plain, it entirely changes its character. The river, which above has been fed by numerous tributaries, now passes through a semi-arid region, which in places is quite a desert. In the steppe, no water is received, but much is lost by evaporation, and the slope is very gentle. This combination of conditions must produce an overloaded stream, therefore it is not surprising to find the great river threading its way across the plain in numerous distributaries, and finally flowing through the many arms of a delta into the Caspian Sea. The floodplain, including, of course, its extension, the delta, is highly cultivated, and seems like an oasis in the desert. Not only agricultural pursuits, but fisheries, too, are important; the well known caviar, prized by many as a delicacy, comes from the lower Volga. Compared with other rivers, the Volga is much longer than of right it ought to be: for a great length of its lower course lies in reclaimed land, reclaimed not by man but by nature. Were the Manytsch Valley north of the Caucasus to sink, so that through the Sea of Azov the Caspian depression could communicate with the ocean, as it probably once did, the mouth of the Volga, would be at Saratow, which is at sea level, instead of at Astrachan, 80 feet below. The Volga is one of the few large rivers that flow a considerable distance below the level of the sea. Thus it happens that the largest of European rivers ends in a lake, the largest lake, it is true, and salty, but cut off entirely from the ocean.

NOTES ON ECONOMIC GEOGRAPHY

By E. V. Robinson

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The attempted revolution in Mexico against the Diaz regime seems to have been in large part an anti-American movement. The explanation of this movement seems to be in the main an economic one. For many years American capital has been invested in mines and railways, until it is thought that $500,000,000 have been so invested in Mexico. More recently a number of American real estate speculators and promoters have acquired large holdings in Mexico for the purpose of sale to Americans. A great share of those who bought lands of them have had sad experiences, but it is nevertheless true that colonies of prosperous American farmers have been established in the Tampico District, and likewise in the more southern states of Mexico. This influx of American capital and American settlers has alarmed the easy-going natives, who find themselves at a disadvantage in competition. The question which students of Mexican conditions have been asking these many years, namely; "After Diaz what?" thus seems likely to have an early answer.

In Central America a railway merger is on foot in Guatemala which is to be financed by American capitalists. The same interests are seeking to control all the railways in Salvador. When this combination is complete the Pacific ports of Ocas and Champarico, which are inadequate for large vessels, will be abandoned in favor of San Jose, on the Pacific side, and the Caribbean ports.

In Jamaica the cane sugar industry is reported to be reviving again. Fruit, especially bananas, are becoming constantly more important. On the other hand coffee is ceasing to be an estate crop, and the same is true of tobacco. Both are becoming the chief reliance of the negro peasants with large families, who are thus able to supply the necessary hand work at slight expense.

In Trinidad, the existence of large asphalt deposits suggested a probable existence of oil fields. Recently there has been a great boom, recalling the days when "Spindle Top" in Texas had just come into production. The actual amount of oil produced has not been great, but the amount of capital invested is immense. Some of the wells have already turned out to be "gushers," and the indications are that the output will be large within a couple of years.

In Argentina the high price of meats in recent years has greatly stimulated the stock raising industry. Owing to the existence of contagious stock diseases the exportation of stock on the hoof has long since

declined in importance. The exportation of cured or jerked beef has also fallen off. Next came the export of frozen beef, and this has now been exceeded by chilled beef, which is kept at the temperature of from 28 to 30 degrees Fahrenheit. It commands better prices than meat which has been thoroughly frozen. An interesting development in this connection is the fact that Chicago packers have acquired a controlling interest in the largest and most progressive frozen and chilling concerns in South America, including Uruguay, as well as Argentina.

In spite of the increased price of meat, sheep are diminishing in number, even in Argentina. The increase of tillage has added so much value to the land that it cannot be used profitably for sheep raising. The same process has been at work in other countries with a result that out of the 500,000,000 sheep which (it is calculated) existed in 1873, there are hardly more than one-half that number in the world at present. Hogs and poultry, on the other hand, have not yet come into favor in Argentina because stock raising is still on large ranches, while hogs and poultry are better handled on smaller farms with more intensive use.

IN AUSTRALIA the route from Port Augusta to Kalgoorlie has been surveyed. The railway will be 1,063 miles long and is estimated to cost $20,000,000.

In contrast to the practice of the Russians, the Japanese have opened the west harbor of PORT ARTHUR to ships of all nations, thus making it a commercial port. The Russians, it will be remembered, built Dalny to serve as the commercial port of the peninsula. It is assumed by some that the action of the Japanese means that they attach comparatively little military importance to Port Arthur.

AN INTERESTING DEVELOPMENT IN CHINA has been the shipment of a cargo of coal to San Francisco. Owing to the scarcity and high price of fuel on the Pacific coast, this is a trade which may possibly reach considerable proportions. On the other hand, the export of American cotton goods to China has decreased to a marked extent. Japanese cottons, however, are finding a constantly larger market in China.

IN MALAYSIA great changes have occurred in recent years. The area under British protection has largely increased. The railway net has also been extended in a way that suggests the boom times of the early 70's in America. The latest project is the construction of a trunk line from Bangkok to Singapore, which would connect the British part of the Malay peninsula with the main line and eventually with the Indian railway system. The motive for much of this development is the great extension of rubber planting. Even suburbs of Singapore have been taken up for rubber plantations. It is calculated that 75 rubber companies, capitalized at $80,000,000 have been established in this region.

In no part of Asia, however, have changes been more rapid than IN ASIATIC TURKEY, under the regime of the Young Turks. The port of Samsoun, on the Black Sea, has doubled its population in a few years, and its trade already surpasses that of Trebizond, which is the historic port of northwestern Persia. In anticipation of a railway which is to be built inland from Samsoun, an automobile service has been established south to Sivas. The Bagdad railway is also making progress again after several years of delay. Construction work has begun on the sections from Adana to Konia, and also in the opposite direction from Adana to Aleppo. This will put Aleppo on the main line in place of a branch, as was originally planned. In the plains of the Lebanon region, between Beirut and Damascus, an American steam plow is now in operation on one of the large estates. This plow accomplishes in one day with two men, the work of 60 oxen and 60 men.

THE CURRANT INDUSTRY OF GREECE is again in serious straits. Some years ago over production led to the formation of a government warehouse system, backed by a government bank, and designed to obtain a part of the crop and thus to put up the price. The increased price, however, led to the planting of more land in currants, with a result that a constantly larger part of the crop had to be taken by the government warehouses in order to prevent a fall in the price. The increased price of currants, moreover, naturally caused a decrease of exports which still further augmented the amount which the warehouse had to hold. In 1905 a private corporation was chartered to take over the currants accumulated in the government warehouse and carry on the campaign for higher prices. It was given a practical monopoly of the currant trade by the government, and various forms of financial aid as well; but in spite of these advantages the company is in danger of being swamped by the amount of currants grown. This seems to be a clear case of failure of monopoly, owing to the inability to control the supply.

Recently a cargo of American lumber was unloaded from the ocean steamer in Venice into canal barges which were towed up the river and through various canals to Milan. This signalized the opening of a new all water route to Milan.

During the past year a new line of steamers has been established from Galveston and New Orleans direct to Ghent, and other regular lines are planned to Ghent from Baltimore and Philadelphia. This has been made possible by the opening of the new ship canal to Ghent. In this connection it is interesting to note that the Manchester ship canal, which was long thought a failure, has developed so much traffic that during the past year Manchester became the 4th port in the British Isles in tonnage of shipping, taking the place hitherto held by Glasgow.

QUESTIONS ON SOUTH AMERICA

By M. LILLIAN NEWMAN, State Model School, Trenton, N. J.

1. Compare the size of South America with that of the United States. (Twice the size of the United States including Alaska.)

2. What circles cross it? Therefore, in what zones does it lie?

3. Why do the Northeast Trade Winds bring plentiful rainfall to northern South America while they are drying winds over northern Africa?

4. What effect has the west wind over Chile? Over Argentina? Why the difference?

5. Account for the desert of Atacama in northern Chile.

6. Prove that this desert is far from useless.

7. What are the three great river systems? Why *east* of the Andes?

8. Give name and characteristics of the plain drained by each of these rivers.

9. In what does the chief importance of the Amazon River lie?

10. Why has the Amazon not become of greater value as a trade route?

11. How has the short railroad (200 miles) built around the falls of the Madeira near San Antonio affected Bolivia and also Para?

12. What three races of people make up the population of South America?

13. Why do most of the people live near the coast?

14. Name and locate each of the countries of South America.

15. What is the government of all except the Guianas?

16. Which nations have fairly stable governments? Why are there such frequent revolutions in South America?

17. What is the general condition of education in South America?

18. What is the prevailing religion? Can you explain why?

19. Name the three most important countries of South America?

20. Compare Argentina with the United States as to climate, productions, population and facilities for transportation.

21. In what respect may Buenos Aires be likened to New York City? What one great advantage has the latter? (Outlet of a much larger productive area.)

22. Describe the Trans-Andine Railroad. When completed? Why important?

23. Two productions form 82 per cent. of Brazil's exports: What are they?

24. Each of the following cities exports large quantities of certain commodities: Rio Janeiro, Santos, Para, Pernambuco, Valparaiso, Buenos Aires, Iquique. Name the commodity in each case.

SPEAKING OF GLACIERS

Did you know,—

1. That the largest glaciers in North America are in Greenland and Alaska?
2. That the largest glaciers in the United States are on Mt. Rainier, Washington?
3. That when glaciers extended southward beyond St. Louis in the United States, nearly all of Alaska was free from ice?
4. That the Malaspina Glacier in Alaska is larger than Rhode Island?
5. That mature trees are growing upon the nearly-motionless, dirt-covered margins of the Malaspina Glacier?
6. That a glacier in Alaska has recently advanced two miles in less than three years, and probably in less than one year?
7. That earthquakes, as well as increase in snowfall, may sometimes cause stagnant mountain-glaciers to advance?
8. That glaciers sometimes cover the sides of active volcanoes, as on Mt. Wrangell, Alaska?
9. That there are glaciers upon high mountains in the equatorial region, as in South America and Africa?
10. That most of the lakes and waterfalls in the United States are due to former glaciers?
11. That the richest wheat land in the United States is the bottom of a former glacial lake,—Lake Agassiz in the valley of the Red River of the North?
12. That the continental glaciers removed thousands of tons of rich iron ore from Canada and the Lake Superior region?
13. That diamonds weighing up to 21 carats, and from an unknown source, are found in the glacial drift of the United States?
14. That there were glaciers in South Africa, India, and Australia about the time the coal beds were being formed in Pennsylvania?
15. That these South African glaciers moved poleward, not toward the equator?
16. That there is a Driftless Area of Wisconsin, Iowa, and Illinois, which was entirely surrounded by glacial ice, but was never covered?
17. That icebergs from Greenland form a menace to navigation at some times of the year off the Grand Banks of Newfoundland?
18. That New Zealand, Patagonia, and Alaska have fiords similar to those of Norway, and that they were largely excavated by glaciers?
19. That the Muir Glacier in Alaska has retreated over 8 miles in 8 years, beginning in 1899, and has lost much of its scenic beauty?

L. M.

COMMERCIAL CUBA

The island of Cuba has a total area about the same as that of the state of Pennsylvania. Cuba is about 100 miles from Key West, and the harbor of Havana, which as is well known is one of the finest in the world, is 306 miles from Tampa, Florida and 1,227 from New York.

The population of Cuba, according to the census of 1907, was 2,048,000, or about equal to that of the city of Philadelphia and its suburbs in 1910. The population was made up of 1,440,000 white persons and 608,967 colored.

Cuba is mainly an agricultural country, nearly one-half of its working population being employed on farms and plantations, and ninety-five per cent of the value of its exports being made up of agricultural products. Sugar and tobacco are the staple products and in 1909 the value of the former exported was 60 per cent and of the latter 28 per cent of that of the total exports.

According to *Willet and Gray's* estimate of the world's cane sugar production for 1910 there were 8,326,152 tons produced. Of this 1,750,000 tons, or nearly 30 per cent, was produced in Cuba; Java, the next larger producer, having an output of 1,200,000 tons. Of the 186 plantations in operation in 1910, 72 were owned by Cubans, 72 by English, French, Spanish, etc., and 38 by corporations or citizens of the United States, yet the latter produced 34 per cent of the crop, as against 32 per cent by Cuban plantations and 34 per cent by those owned by Europeans. The production of sugar this year exceeds that of the abnormally high production of last year, and is the largest ever raised in Cuba. Every season finds the acreage of cane planted larger than it was the season before, and it also finds the mills equipped with better and more modern machines, resulting in finer work.

Tobacco ranks next in importance to sugar among Cuban products. The crop of leaf tobacco for 1909 was 517,000 bales of 120 lbs. each. The finest tobacco in the world is grown in the province of Pinar del Rio, some little distance from Havana. Coffee, which was once the chief crop of Cuba—the island having exported 50 million pounds in 1846—is now of little importance.

Fruits have only recently been cultivated on an extensive scale. Already 1,500,000 sweet orange trees have been planted. The grape fruit, which grows wild, yields prodigious crops. The pineapple, considered the queen of fruits, is extensively cultivated, with an annual production of over 75 million pounds. Bananas are also raised in enormous quantities; the home consumption is over 250 million pounds, while the export is fully 100 million pounds.

The commercial affairs of Cuba are, and always have been, a matter of particular interest and importance to the people of the United States. The main products of the island are in great demand and almost in universal use in the United States, and many of the products of this country are of vital necessity to the Cubans. The close proximity of the island to the United States makes the two markets mutually of easy and convenient access, while the markets of the great European and Asiatic nations lie thousands of miles away across wide oceans. It is obvious, without argument, that the United States naturally should furnish to Cuba the bulk of its outside supplies, even as the Cubans naturally find in the United States their own best customer.

The citizens of Cuba are rapidly developing their territory and its wonderful resources, and are already producing more sugar and tobacco than in any former period. Large amounts of capital from the United States are already invested in Cuba and this is likely to continue because of the profitable returns made from the various projects in which it has been employed. While this extraordinary development could not have occurred if it had not been for the wonderful soil and climate of Cuba and the industry of its people, on the other hand it could not have reached this extraordinary proportion without the aid of foreign capital which has become interested in the development of the resources of the island.

The charts give the trade of Cuba by countries for the calendar year 1909. As the purchasing power of the country is dependent upon the value of its exports, the fact that the exports amounting to $124,711,000 were the greatest Cuba ever had, is sure to have a good effect on the future trade of the country. It will be seen that fully one-half of the imports were bought from, and 87 per cent of the exports were sold to, the United States.

The United States and Cuba each need the products of the other and there is no reason why their ability to supply each other's wants should not increase with the passing years. With the exception of Canada, Cuba buys more per capita from the United States than any other nation and this will no doubt increase as the ability of the Cubans to buy foreign goods increases.—*Commercial America.*

GOVERNMENT PUBLICATIONS

GEOLOGICAL SURVEY.—The U. S. Geological Survey has recently published *The Movement of Lake Superior Iron Ores*, by John Birkinbine, a five page pamphlet, an advance chapter from The Mineral Resources of the United States, Calendar Year 1909. This may be obtained by writing the Director, U. S. Geological Survey, Washington, D. C., or your

congressman. The feature of this publication which recommends it to teachers of geography is the accompanying map of north-central and northeastern United States, showing distribution of ores. It is two feet by three. On it is platted the route by which Lake Superior iron ores are taken to the steel plants. The long water haul through Lakes Superior, Huron, and Erie compares graphically with the short rail haul from the Lake Erie ports to Pittsburg, Pa., Youngstown, Ohio, and other manufacturing centers. The great tonnage going to these places compared with the smaller present amounts to Chicago, Ill., and Gary, Ind., stands out prominently, as does the very small amount transported by rail directly from the iron mines, and by water over the Atlantic Ocean from Scandinavia, southern Europe, and Cuba. The ore shipped from the three ports at the west end of Lake Superior (Duluth, Superior, and Two Harbors) far exceeds that from Ashland or Marquette on Lake Superior or Escanaba on Lake Michigan.

DEPARTMENT OF AGRICULTURE.—Among the publications of the Department of Agriculture which may be obtained by writing the Secretary of Agriculture, Washington, D. C., or your congressman, there are many of geographical quality, of which the following may be cited as illustrations. Fresh material of this nature is being published every year by the government. All these are Department of Agriculture publications:—from the Bureau of Soils, Bulletin 23, *Investigations in Soil Fertility,* by Milton Whitney and F. K. Cameron; from the Bureau of Statistics, Bulletin 29, *Methods and Routes for Exporting Farm Products,* by E. G. Ward Jr.; from the Division of Biological Survey, Bulletin 10, *Life Zones and Crop Zones of the United States,* by C. Hart Merriam.

SMITHSONIAN INSTITUTION.—The following selection of geographical papers published by the Smithsonian Institution, and to be obtained by writing The Secretary, Smithsonian Institution, Washington, D. C., will show the character and scope of material of this sort available for teachers who will write for and use these pamphlets.

No.
1148. The Function and Field of Geography, by J. Scott Keltie.
950. The Present Standpoint of Geography, by Clements R. Markham.
1394. The Progress of Geographical Knowledge, by Col. Sir T. H. Holdich.
1630. The Stature of Man at Various Epochs, by A. Dastre.
1615. On Mountains and Mankind, by Douglas W. Freshfield.
1064. Relations of Human Life to Environment, by J. W. Powell, O. T. Mason, Gardiner G. Hubbard, J. Walter Fewkes, and W. J. McGee.
1839. Inland Waterways, by George G. Chisholm.
1643. The Economic Conquest of Africa by the Railroads, by A. Fock.
1539. The Republic of Panama, by Prof. William H. Burr.
1404. The Nile Reservoir Dam at Assuan, by Thomas H. Means.
1756. Iceland, Its History and Inhabitants, by Jon Stefansson.
1199. Modification of the Great Lakes by Earth Movement, by G. K. Gilbert.
1618. The Yuma Reclamation Project, by J. B. Lippincott.
1617. The Work of the Reclamation Service, by F. H. Newell.
1769. National Reclamation of Arid Lands, by C. J. Blanchard.

EDITORIAL

An Inquiry into Geography-teaching in Germany

As announced in November, the Journal of Geography purposes to carry on, during the current year, an inquiry into the methods and results of geography-teaching in Germany. It is frequently stated that, in that country, geography is taught in a manner and with results that are superior to ours. The editors of the JOURNAL do not know whether this is true or not. The great majority of our readers do not know. All of us would like to know, so that, if the German schools are getting better results than ours are securing, we may learn from them.

Our inquiry will proceed along the following lines:

1. The preparation and general efficiency of German teachers, especially teachers of geography.
2. Their way of handling the subject.
3. The amount of time given to geography.
4. The character of the subject-matter which receives the emphasis, and the chief aims in geography-teaching.
5. The text-books used, the maps and the illustrative and supplementary materials available.

The German school system is quite unlike ours. During the first three or four years of school, pupils attend the elementary schools. At the end of this period a very important separation takes place. A small minority of the pupils—perhaps ten or twelve per cent.—enter one of the standard higher schools. These are the selected pupils, usually of greater promise, who are intended by their parents or advisers for scholarly careers. The other ninety per cent. may remain in the common schools until about fourteen years of age. Of course many do not continue until that age. The most important difference between the German educational system and our own lies in this early separation of the few pupils who may go on toward and to the universities from the many who are, at 9 or 10 years of age, effectively cut off from any such possibility. With all of its excellencies, the German system seems, to an American, to break down at this point.

There are at least three types of these higher schools,—the *classical gymnasium*, the *real-gymnasium* and the *real-schule*. In the first, nearly one-half of the time is devoted to Latin and Greek. In the real-gymnasium, modern languages take the place of Greek. In the real-schule, the German language and modern studies receive the emphasis. After nine years of successful work, and at about 19 years of age, the boy completes this middle course, and is as far advanced as the best of our college students are at the beginning of their junior year. Three or four years more are required to complete the university course. The gymna-

sium is not a free public school. Many places of considerable size have no gymnasium. The boys in the gymnasium are a "picked class," and look forward to intellectual careers.

As the school systems in our various states differ in details but agree in their broader features, so the school systems in the different German states differ and agree.

What of the qualifications of the German teachers as a class?

So far as prolonged schooling and thorough professional training are concerned, they are far in advance of our high school teachers. The faculties of German gymnasia are made up of men of Ph. D. grade. They are the equals of our college faculties in education, and in addition have a special professional preparation, usually of two years. Teaching is an honored profession and attracts the best men.

We do not wish to maintain that the best scholar is the best teacher, or that pedagogical training will always make a good teacher. High scholarship may unfit a man for the work of teaching young pupils. Few competent judges would hold that the best teaching in the United States is done in the universities. Our college graduates are not usually successful teachers in the grades. One part of the writer's work is the inspection of high schools, and he has, as yet, been unable to satisfy himself that teaching efficiency is proportional to the teacher's scholarship. Granting all of this, it still remains unbelievable that the thorough preparation of the German teachers, the class of men who are attracted into the profession, and the respect in which the profession is held, do not combine to give the German schools a higher grade of teaching than our schools can command. This applies to teachers in general. In the special case of geography, German teachers in the gymnasia are much better prepared than are our grade teachers or high school teachers. Only recently have American universities given much attention to geography. Practically every German university has a chair of geography. There the science has developed farther and has a higher standing. So far as facts are obtainable they indicate that fully half of the geography-teaching in German gymnasia is done by teachers who have had special preparation for it. It is doubtful if five per cent. of our teachers have had such preparation.

All in all, we are convinced that on the first count, namely, the preparation of teachers, we must recognize the superiority of the Germans. Whether or not this superiority is offset by a certain narrowness in the choice of the subject-matter upon which the German lays the emphasis, remains to be discussed. Fully half of the time devoted to geography in German schools is spent on the geography of Germany.

In a later discussion, this and other points will be taken up.

R. H. W.

A COMMUNICATION

In the November number of the JOURNAL, there was a favorable comment on an article entitled *"Curious and Characteristic Customs of China."* My feeling concerning the article was that altho it contained considerable information, on the whole it was, from the standpoint of geography, very bad and I am in truth forced to add, detrimental.

The introduction to the world at large is made in many elementary schools through the medium of Jane Andrews' "Seven Little Sisters" and a better start could hardly be planned. The story of the foreign child is told in simple language and there is a noteworthy absence of any element that would estrange the foreign playmate or hold her up to the curious gaze, idle curiosity or the ignorant criticism of the immature mind.

To state the bald facts of customs and especially fashion apart from their origin, in words that must inevitably misrepresent them, cannot be too highly condemned. Stoddard in his Lectures says that a Chinese youth thus describes in all honesty a European dinner:

"Dishes of half-raw meat were served from which pieces were cut with sword-like instruments, and placed before the guests. Finally came a green and white substance, the smell of which was overpowering. This, I was formed, was a compound of sour milk, baked in the sun, under whose influence it remains until it becomes filled with insects; yet the greener and livelier it is, the greater the relish with which it is eaten. This is called Che-sze."

The record is the truth; I doubt if we can tell the story of Chinese customs any more fairly. I imagine that the account of a Chinese dinner in the above mentioned article on "Curious Customs" is somewhat less fair than the Chinese account of the European dinner.

Lastly, there is an easy line between the crude statement of a curious custom and a ridiculous rendering of the description. This latter stage arises generally from ignorance; on the other hand extremes in fashion are found the world over and the curiosities are not all of them in distant lands. Peary writes in his *"Northward over the Great Ice Sheet"* of an Eskimo woman, "gaunt and tall in figure, brown and wrinkled of face," dubbed by the men "Sairy Gamp," who went into hysterics of laughter at the sight of Mrs. Peary dressed in the garb of our latitude. I have read some descriptions in purported geographical articles and heard them in the class room that were not far above the plane of "Sairy Gamp."

In all teaching of races, anything that savors of ridicule or crudeness of description ought to be avoided. The geographic items ought to be presented fairly, and when they are so presented they will not build higher the wall of race prejudice.

R. M. BROWN.

BOOK REVIEWS AND NOTICES

GUIDE TO GEOGRAPHICAL BOOKS AND APPLIANCES. Prepared by Members of the Geographical Association and published by George Philip and Son, London, 1910, 207 pp. viii+210; price 5 s. net. $1.20.

In 1897 the eminent geographer Dr. Hugh Robert Mill performed a noteworthy task and placed the geography teachers of the world under great obligation to him by publishing his *Hints to Teachers and Students on the Choice of Geographical Books for Reference and Reading.* That small but necessary volume has now been brought down to date, amplified, revised and reprinted through the efforts of the Geographical Association of Britain.

The volume contains eighteen chapters giving detailed, annotated lists of books and materials for geography teaching, each chapter being introduced by brief comments on the use and value of the suggested helps. References to books in foreign languages are few, inasmuch as the volume is intended for teachers in Britain who may have no knowledge of French, German or any other continental language. The lists are fairly complete, well selected and concisely summarized. The chapters devoted to Atlases, Maps, General Reference Books and the Regional Geography of the countries of the Eastern Hemisphere are particularly valuable to American teachers.

The chapters are listed herewith to show the inclusiveness and scope of the book: The Teaching of Geography; Atlases and Maps; Geograhpical Apparatus and Pictures; Geographical Novels; General Reference Books; Text Books for School Use; Astronomical Geography and Cartography; Figure and Movement of the Earth and Mapping; Physiography and Physical Geography; Geography of Plants and Animals; Geography of Man; The British Empire; Europe; Asia; Africa; North America; The West Indies and Central and South America; Australasia and the Pacific Islands; The Polar Regions.

To show the inclusiveness of the several chapters it may be noted that the chapter on General Reference Books has the following sub-headings: Rules for the Orthography of Geographical Names; Lists of General Reference Books; General Descriptive Works, Gazetteers and Dictionaries, Year Books and Bibliographies, Geographical Journals.

In spite of a few slips of a typographic nature and the relative paucity of the lists on the United States and North America, the volume is an indispensable reference volume for all elementary and normal school teachers of geography in our country. It has been awaited longingly for many months and realization in this case proves better than anticipation.

RICHARD E. DODGE.

THE CONSERVATION OF NATURAL RESOURCES IN THE UNITED STATES, By C. H. VAN HISE, President of the University of Wisconsin, 431 pages, 16 plates, 20 figures, $2.00. The Macmillan Co.

This attractive volume is a valuable reference for classes in geography, industrial history, political economy and the social sciences, and it will serve well the general reader.

An introduction of 15 pages reviews the history of the conservation movement in the United States. The text proper has five parts. Part 1 treats of the minerals, giving 86 pages principally to coal, petroleum, natural gas, iron ore, copper, gold and silver. These are discussed from the standpoint of conservation, describing for each its occurrence, amount available, accessibility, quality, mining and production. Part II gives 96 pages to the water resources, the leading subjects being water power, navigation and irrigation. Some space is given to methods of controlling water resources in different countries, and to State and Federal rights. In part III, there are 56 pages on Forest Resources, describing among other things the various regions, public and private holdings, utilization, and forest policies. Part IV treats of the soil regions of the United States, land classification, land ownership, soil fertility, reclamation, farm management, etc. In some respects this is the most complete part of the text. Part V is on the Conservation of Man. About 16 pages are here given to length of life, disease, sanitation, accidents, infant mortality, child labor, etc. The conservation of other vital resources is not considered. An appendix of 20 pages, in three parts, recites the Declaration of Conservation Principles set forth by the Association of Governors in 1908.

President Van Hise is well qualified to write on Conservation. He is a leader in both State and Federal Conservation organizations. It should be noted also that he stands for proper development of resources but against those abuses which produce bad results. G. E. CONDRA,

President of the Association of State Conservation Commissions.

ELEMENTARY PHYSIOGRAPHY. By Professor Rollin D. Salisbury, University of Chicago. 12 mo. 359 pp. 47 plates. $1.30. Henry Holt & Co.

The book is much like the author's two earlier texts on the same subject. The presentation is terse, concise, and usually authoritative and the illustrations, both photographs and maps, are generally good. Many teachers will find the treatment of the atmosphere too long, for it comprises nearly a third of the book. Most physiography books have more on shorelines. Lake St. Clair (p. 93) appears without an outlet, as in Salisbury's two earlier texts on physiography, and the Kentucky river (Pl. XIX, Fig. 1) flows over some 1400-foot hills in a poorly registered map. Human geography is introduced in connection with many of the topics. L. M.

COMMERCIAL GEOGRAPHY. By Edward Van Dyke Robinson of the University of Minnesota. 8 vo. 492 pp. Rand, McNally & Co., $1.25.

This is a welcome example of the application of definitely stated economic principles to the subject in hand. Previous text-books on commercial geography have been content, at most, with the implication of such principles, and to high school teachers, whose pupils cannot be held for any acquaintance with economics, the relief from much supplementary teaching will be especially welcome. Another feature tending to definiteness, is the acceptance of the localization of industries as the single purpose of the work; this makes possible and even necessary the omission of a confusing mass of details and technicalities, and will especially relieve the high schools that allow only one-half year to commercial geography. Even this book must be abridged by high schools with the shorter course, but the problem is simple, as is explained in the suggestive introduction to the accompanying Exercises and References. Other good features are the logical and uniform outlines of the regional chapters, the use of the historical review, the stress laid on the importance of soils and forests, and the two summarizing chapters. JANET MONROE WALLACE.

Several years ago the Swiss government issued a wall map of Switzerland for school use that was then, as it is still, the finest work of its kind. Now an *Atlas fur Mittelschulen* has been prepared which again breaks the record in educational cartography. It is published by the "Kartographia-Winterthur-Actien-Gesellschaft," 1910, and is to be ordered through the "Sekretariat der Konferenz der kantonalen Erziehungsdirektoren" in Zurich. It contains 133 large pages and some 280 maps and diagrams. Following the recommendations of several geographical congresses, the style of projection and the scale are indicated with conscientious care. Uniform color schemes for altitude in relief maps, for temperature in climatic maps, for density in population maps, and so on, are employed through the volume. Most of the maps are either physical, climatic or political, but there are also many others showing the distribution of religions, languages, industries, products and geological formations. The relief maps of certain parts of Switzerland on a scale of 1: 125,000 are unusually effective. A wise restraint has limited the number of cities in the political maps; and an ingenious use of different sized type indicates the population of those that are deemed worthy of being represented. It will be, we fear, a long time before anything comparable to this atlas of the mountainous little republic in Europe is placed at the service of the schools in our several states; but if an enterprising publishing house wishes to try a venture and can secure the services of a committee of educators and of a number of well trained cartographers, we commend this Swiss atlas to them as a worthy model for imitation. W. M. D.